CLAIMS

1. A method for acquiring information about a target through the use of electromagnetic radiation, the method comprising:

modulating a first portion of an emission of electromagnetic radiation with a first modulating device;

modulating a second portion of the emission of electromagnetic radiation with a second modulating device;

radiating a reflective target with the first portion and the second portion to form a first reflected portion and a second reflected portion; and

determining information about the target by processing the first reflected portion and the second reflected portion.

2. The method of claim 1, wherein the emission of electromagnetic radiation has a wavelength of approximately one millimeter or less.

3. The method of claim 1, wherein the emission of electromagnetic radiation is coherent.

4. The method of claim 1, wherein the emission of electromagnetic radiation is incoherent.

5. The method of claim 3, further comprising destroying the coherence of the second portion so that the first portion is coherent and the second portion is incoherent.

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6. The method of claim 1, wherein the first modulating device comprises a first modulator, and the second modulating device comprises a second modulator.

7. The method of claim 6, wherein the first modulator and the second modulator are selected from the group consisting of: an electro-optic modulator, an opto-mechanical modulator, an acousto-optic modulator, a photorefractive modulator, a ferroelectric modulator, and a magneto-optic modulator.

8. The method of claim 1, wherein the first modulating device comprises a plurality of modulators, and the second modulating device comprises a plurality of modulators.

9. The method of claim 1, further comprising modulating at least one additional portion of an emission of electromagnetic radiation with at least one additional modulating device.

10. The method of claim 1, wherein modulating a first portion comprises amplitude modulating the first portion, and wherein modulating a second portion comprises amplitude modulating the second portion.

11. The method of claim 1, wherein modulating a first portion comprises frequency modulating the first portion, and wherein modulating a second portion comprises frequency modulating the second portion.

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12. The method of claim 1, wherein modulating a first portion comprises polarization modulating the first portion, and wherein modulating a second portion comprises polarization modulating the second portion.

13. The method of claim 1, wherein modulating a first portion comprises phase modulating the first portion, and wherein modulating a second portion comprises phase modulating the second portion.

14. The method of claim 1, wherein determining information comprises determining a velocity of the target.

15. The method of claim 1, wherein determining information comprises determining a range of the target.

16. The method of claim 1, wherein determining information comprises generating an image of the target.

17. The method of claim 1, wherein determining information comprises processing the first reflected portion and the second reflected portion with a receiver configured for direct detection.

18. The method of claim 1, wherein determining information comprises processing the first reflected portion and the second reflected portion with a receiver configured for coherent detection.

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19. The method of claim 1, wherein determining information comprises detecting a signal representing a difference between the first reflected portion and the second reflected portion.

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20. A method for acquiring information about a plurality of targets through the use of electromagnetic radiation, the method comprising:

radiating a first reflective target with a first emission of electromagnetic radiation that has been created from two differently modulated emissions of electromagnetic radiation;

radiating a second reflective target with a second emission of electromagnetic radiation that has been created from two differently modulated emissions of electromagnetic radiation; and

determining information about the first and second targets by processing that portion of the first emission that is reflected off the first target and that portion of the second emission that is reflected off the second target.

21. The method of claim 20, wherein the first and second emissions occupy distinct bandwidths.

22. The method of claim 20, wherein the first emission and the second emission each have wavelengths of approximately one millimeter or less.

23. The method of claim 20, wherein determining information comprises determining a first velocity of the first target and a second velocity of the second target.

24. The method of claim 20, wherein determining information comprises determining a first range of the first target and a second range of the second target.

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25. The method of claim 20, wherein determining information comprises generating a first image of the first target and a second image of the second target.

26. The method of claim 20, wherein determining information comprises processing that portion of the first emission that is reflected off the first target and that portion of the second emission that is reflected off the second target with a receiver configured for direct detection.

27. The method of claim 20, wherein determining information comprises processing that portion of the first emission that is reflected off the first target and that portion of the second emission that is reflected off the second target with a receiver configured for coherent detection.

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28. A method for acquiring information about a target through the use of electromagnetic radiation, the method comprising:

splitting a beam of electromagnetic radiation into at least a first portion and a second portion;

modulating the first portion with a first modulating device;

modulating the second portion with a second modulating device;

combining the first portion and the second portion to form a hybrid beam;

radiating a reflective target with the hybrid beam to form a reflected beam; and

determining information about the target by processing the reflected beam.

29. The method of claim 28, wherein the beam of electromagnetic radiation has a wavelength of approximately one millimeter or less.

30. The method of claim 28, wherein the beam of electromagnetic radiation is coherent.

31. The method of claim 28, wherein the beam of electromagnetic radiation is incoherent.

32. The method of claim 30, further comprising destroying the coherence of the second portion so that the first portion is coherent and the second portion is incoherent.

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33. The method of claim 28, wherein the first modulating device comprises a first modulator, and the second modulating device comprises a second modulator.

34. The method of claim 33, wherein the first modulator and the second modulator are selected from the group consisting of: an electro-optic modulator, an opto-mechanical modulator, an acousto-optic modulator, a photorefractive modulator, a ferroelectric modulator, and a magneto-optic modulator.

35. The method of claim 28, wherein the first modulating device comprises a plurality of modulators, and the second modulating device comprises a plurality of modulators.

36. The method of claim 28, further comprising:

splitting the beam of electromagnetic radiation into a third portion;

modulating the third portion with a third modulating device; and

combining the third portion with the first portion and the second portion to form the hybrid beam.

37. The method of claim 28, wherein modulating a first portion comprises amplitude modulating the first portion, and wherein modulating a second portion comprises amplitude modulating the second portion.

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38. The method of claim 28, wherein modulating a first portion comprises frequency modulating the first portion, and wherein modulating a second portion comprises frequency modulating the second portion.

39. The method of claim 28, wherein modulating a first portion comprises polarization modulating the first portion, and wherein modulating a second portion comprises polarization modulating the second portion.

40. The method of claim 28, wherein modulating a first portion comprises phase modulating the first portion, and wherein modulating a second portion comprises phase modulating the second portion.

41. The method of claim 28, wherein determining information comprises determining a velocity of the target.

42. The method of claim 28, wherein determining information comprises determining a range of the target.

43. The method of claim 28, wherein determining information comprises generating an image of the target.

44. The method of claim 28, wherein determining information comprises processing the reflected beam with a receiver configured for direct detection.

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45. The method of claim 28, wherein determining information comprises processing the reflected beam with a receiver configured for coherent detection.

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46. A system for acquiring information about a target through the use of electromagnetic radiation, the system comprising:

a first modulating device configured to modulate a first portion of an emission of electromagnetic radiation;

a second modulating device configured to modulate a second portion of the emission of electromagnetic radiation;

an aperture configured to radiate a reflective target with the first portion and the second portion to form a first reflected portion and a second reflected portion; and

a receiver configured to determine information about the target by processing the first reflected portion and the second reflected portion.

47. The system of claim 46, wherein the emission of electromagnetic radiation has a wavelength of approximately one millimeter or less.

48. The system of claim 46, wherein the emission of electromagnetic radiation is coherent.

49. The system of claim 46, wherein the emission of electromagnetic radiation is incoherent.

50. The system of claim 48, further comprising a phase destroying device configured to destroy the coherence of the second portion so that the first portion is coherent and the second portion is incoherent.

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51. The system of claim 46, wherein the first modulating device comprises a first modulator, and the second modulating device comprises a second modulator.

52. The system of claim 51, wherein the first modulator and the second modulator are selected from the group consisting of: an electro-optic modulator, an opto-mechanical modulator, an acousto-optic modulator, a photorefractive modulator, a ferroelectric modulator, and a magneto-optic modulator.

53. The system of claim 46, wherein the first modulating device comprises a plurality of modulators, and the second modulating device comprises a plurality of modulators.

54. The system of claim 46, further comprising at least one additional modulating device configured to modulate at least one additional portion of an emission of electromagnetic radiation.

55. The system of claim 46, wherein the first modulating device is a first amplitude modulator, and the second modulating device is a second amplitude modulator.

56. The system of claim 46, wherein the first modulating device is a first frequency modulator, and the second modulating device is a second frequency modulator.

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57. The system of claim 46, wherein the first modulating device is a first polarization modulator, and the second modulating device is a second polarization modulator.

58. The system of claim 46, wherein the first modulating device is a first phase modulator, and the second modulating device is a second phase modulator.

59. The system of claim 46, wherein the receiver is configured to determine a velocity of the target.

60. The system of claim 46, wherein the receiver is configured to determine a range of the target.

61. The system of claim 46, wherein the receiver is configured to generate an image of the target.

62. The system of claim 46, wherein the receiver is configured for direct detection.

63. The system of claim 46, wherein the receiver is configured for coherent detection.

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64. The system of claim 46, wherein the receiver is configured to detect a signal representing a difference between the first reflected portion and the second reflected portion.

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65. A system for acquiring information about a plurality of targets through the use of electromagnetic radiation, the system comprising:

a first aperture configured to radiate a first reflective target with a first emission of electromagnetic radiation that has been created from two differently modulated emissions of electromagnetic radiation;

a second aperture configured to radiate a second reflective target with a second emission of electromagnetic radiation that has been created from two differently modulated emissions of electromagnetic radiation; and

a receiver configured to determine information about the first and second targets by processing that portion of the first emission that is reflected off the first target and that portion of the second emission that is reflected off the second target.

66. The system of claim 65, wherein the first and second emissions occupy distinct bandwidths.

67. The system of claim 65, wherein the first emission and the second emission each have wavelengths of approximately one millimeter or less.

68. The system of claim 65, wherein the receiver is configured to determine a first velocity of the first target and a second velocity of the second target.

69. The system of claim 65, wherein the receiver is configured to determine a first range of the first target and a second range of the second target.

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70. The system of claim 65, wherein the receiver is configured to generate a first image of the first target and a second image of the second target.

71. The system of claim 65, wherein the receiver is configured for direct detection.

72. The system of claim 65, wherein the receiver is configured for coherent detection.

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73. A system for acquiring information about a target through the use of electromagnetic radiation, the system comprising:

a beam splitter configured to split a beam of electromagnetic radiation into at least a first portion and a second portion;

a first modulating device configured to modulate the first portion;

a second modulating device configured to modulate the second portion;

a beam combiner configured to combine the first portion and the second portion to form a hybrid beam;

an aperture configured to radiate a reflective target with the hybrid beam to form a reflected beam; and

a receiver configured to determine information about the target by processing the reflected beam.

74. The system of claim 73, wherein the beam of electromagnetic radiation has a wavelength of approximately one millimeter or less.

75. The system of claim 73, wherein the beam of electromagnetic radiation is coherent.

76. The system of claim 73, wherein the beam of electromagnetic radiation is incoherent.

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77. The system of claim 75, further comprising a phase destroying device configured to destroy the coherence of the second portion so that the first portion is coherent and the second portion is incoherent.

78. The system of claim 73, wherein the first modulating device comprises a first modulator, and the second modulating device comprises a second modulator.

79. The system of claim 78, wherein the first modulator and the second modulator are selected from the group consisting of: an electro-optic modulator, an opto-mechanical modulator, an acousto-optic modulator, a photorefractive modulator, a ferroelectric modulator, and a magneto-optic modulator.

80. The system of claim 73, wherein the first modulating device comprises a plurality of modulators, and the second modulating device comprises a plurality of modulators.

81. The system of claim 73, wherein the beam splitter is further configured to split the beam of electromagnetic radiation into at least a third portion, wherein the system further comprises a third modulating device configured to modulate the third portion, and wherein the beam combiner is further configured to combine the third portion with the first portion and the second portion to form the hybrid beam.

82. The system of claim 73, wherein the first modulator is a first amplitude modulator, and wherein the second modulator is a second amplitude modulator.

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83. The system of claim 73, wherein the first modulator is a first frequency modulator, and wherein the second modulator is a second frequency modulator.

84. The system of claim 73, wherein the first modulator is a first polarization modulator, and wherein the second modulator is a second polarization modulator.

85. The system of claim 73, wherein the first modulator is a first phase modulator, and wherein the second modulator is a second phase modulator.

86. The system of claim 73, wherein the receiver is configured to determine a velocity of the target.

87. The system of claim 73, wherein the receiver is configured to determine a range of the target.

88. The system of claim 73, wherein the receiver is configured to generate an image of the target.

89. The system of claim 73, wherein the receiver is configured for direct detection.

90. The system of claim 73, wherein the receiver is configured for coherent detection.

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